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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,377	06/20/2003	Chien-Chou Hou	B-5130 621033-6	8506
36716	7590	01/11/2006	EXAMINER	
LADAS & PARRY 5670 WILSHIRE BOULEVARD, SUITE 2100 LOS ANGELES, CA 90036-5679			DEO, DUY VU NGUYEN	
			ART UNIT	PAPER NUMBER

1765

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Please find below and/or attached an Office communication concerning this application or proceeding.



## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-10, 12-15, 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. (US 6,204,130) and admitted prior art.

Gardner teaches an etching method comprising: providing a patterned polysilicon (claimed silicon) (col. 4, line 15-33); forming an oxide layer (claimed etching buffer layer) by oxygen treatment and H<sub>2</sub>O (claimed etching agent) (col. 4, line 34-43) conformally on the surface and the top layer of the patterned polysilicon layer (col. 4, line 34-43); etching the oxide layer to reduce the thickness of the polysilicon layer (col. 4, line 46-col. 5, line 10). Since the oxide removed is made from the polysilicon, the exposed polysilicon would also be etched when the oxide is removed from the polysilicon surface, in which the thickness of the polysilicon would be reduced. The etching of the polysilicon would inherently produce etching residues on the sidewalls thereof (please page 1 of the specification). Unlike claimed invention, Gardner doesn't describe etching the etching residues from the pattern silicon layer. However, one skilled in the art at the time of the invention would find it obvious to remove the etching residues so that it doesn't create a problem that is known to one skilled in the art such as interfering with

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the process of reducing the pattern silicon layer in a later process (please see page 1, line 20-page 2, line 2 of the specification).

Referring to claims 7, 8, 14, 15 the polysilicon is patterned by using a photoresist layer (claimed patterned mask).

Referring to claims 2, 3, 9, 10, 14, 19, the oxide layer is formed by thermal oxidation of using oxygen (col. 4, line 34-41). This would form claimed silicon oxide ( $\text{SiO}_2$ ).

Referring to claims 6, 13, and 18, the thickness of the polysilicon pattern is 100-300 nm (col. 4, line 13).

Referring to claims 5, 12, 17, Gardner doesn't describe the thickness of the oxide (etching buffer layer) is about 5-20 nm. However, he teaches that the oxide layer growth can vary and suitably selected in consideration of the desired final thickness of the remaining polysilicon pattern (col. 4, line 44-54). Therefore, it would have been obvious for one skilled in the art to determine the thickness of the oxide layer through routine experimentation depending on the final desired thickness of the patterned polysilicon as suggested by Gardner.

Referring to claim 20, Gardner doesn't describe the thermal oxidation is performed at about 10-90 degrees C. However, it would have been obvious for one skilled in the art to determine the processing parameters including the T through routine experimentation in order to provide optimum T for the oxidation of the polysilicon with a reasonable expectation of success.

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3. Claims 4, 11, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner and admitted prior art as applied to claims 1, 7, 14 above, and further in view of Schloesser et al. (US 5,977,589).

Referring to claims 4, 11, and 16, even though Gardner doesn't describe using gas such as Cl<sub>2</sub> for etching of the oxide; however, he suggests that plasma-chemistry can be used for the etching (col. 5, line 9). Schloesser teaches that Cl<sub>2</sub> can be used for etching oxide layer (col. 8, line 42-46). It would have been obvious for one skilled in the art to etch the oxide layer in light of Schloesser's teaching because he further teaches gas that is silent in Gardner in order to etch the oxide layer with a reasonable expectation of success.

***Response to Arguments***

4. Referring to applicant's argument that Gardner doesn't show the oxide layer is created on the patterned silicon layer, please see fig. 2E showing an oxide layer 211 is formed on the pattern silicon layer 210. Also, Gardner describes the oxidation using O<sub>2</sub> and H<sub>2</sub>O, which would read on claimed etching agent.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-2:30 Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Primary Examiner

Duy-Vu N. Deo

1/9/06

